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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,783	12/20/2001	Henricus Franciscus Johannus Jacobus Van Tongeren	NL 000766	3215

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EXAMINER

KRISHNAN, SUMATI

ART UNIT PAPER NUMBER

2879

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,783

Applicant(s)

VAN TONGEREN ET AL.

Examiner

Sumati Krishnan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Arguments

Applicant argues that Sturm does not disclose printing of the metal in molten form.

Examiner agrees, but has provided below a new basis for rejections of the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Sturm (US 6087196).

Regarding claim 1, Sturm et al discloses an EL device comprising a pattern-wise ink jet printed electrode for supplying charges to an EL layer of the device, the electrode comprising a metal or metal alloy that is ink-jet printed. See column 6 lines 1-10, for example. The limitation that the electrode be ink-jet printed in a molten form constitutes a product-by-process claim limitation and is not afforded patentable weight since the process limitation does not serve to further define the product itself.

Regarding claim 4, the electrode is an electrode for supplying electrons to the EL layer.

2. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Sreeram (US 6140759).

Sreeram discloses an EL device comprising a pattern wise ink jet printed electrode 114 for supplying charges to an EL layer, the electrode comprising a metal, further comprising a

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relief pattern 112 for patterning the pattern wise ink jet printed electrode. The limitation that the electrode be ink-jet printed in a molten form constitutes a product-by-process claim limitation and is not afforded patentable weight since the process limitation does not serve to further define the product itself.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturm et al (US 6087196).

Regarding claim 3, Sturm discloses the EL device of claim 1 but does not specifically disclose the melting point of the electrode. However, it is old and well known in the art to provide an electrode with a low melting point (less than 250 C) so that the temperature while manufacturing is low enough to save on cost as well as prevent unnecessary damage that comes about in high temperatures. Therefore, it would have been obvious to provide the electrode of Sturm with such a low melting point in order to protect the device against damage and save on cost.

Regarding claim 7, Sturm discloses the EL device of claim 1, but does not disclose the device being a passive matrix display. However, it is well known in the art to provide a passive matrix of EL elements comprising of row and column electrodes with sandwiched EL layers in

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order to provide a display device for a number of applications. Therefore, it would have been obvious to provide the EL element of Sturm in a passive matrix display because such a configuration is so common when providing a display device.

Regarding claim 8, Sturm discloses the EL device as described in claim 1, but does not disclose a battery operated or hand held electronic device provided with this EL device. However, it is old and well known in the art to use EL elements in electronic devices such as mobile phones. It would have been obvious to one of ordinary skill in the art to have used Sturm's invention in an electronic device because this is one of its most common applications.

4. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturm et al (US 6087196) in view of Hung et al (US 5608287). Sturm discloses the EL element of claims 1 and 4, but does not disclose the electrode having a work function of 4.5 eV or less. However, it is very common to make electrodes of an EL device with work functions of 4.5 eV or less. For example, Hung et al discloses that the bottom electrode be made of alkaline or rare earth metals with work functions of less than 4.0 eV such as metal silicates or metal borides. Hung discloses that these metals provide protection from atmospheric corrosion. Therefore, it would have been obvious to one of ordinary skill to have used such a metal for the electrode of Sturm in order to protect the EL device from atmospheric corrosion.

5. Claims 2,17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows (US 5980976) in view of Sturm et al (US 6087196).

Regarding claim 2, Burrows discloses an EL device comprising an electrode having a thickness of at least 5 microns. See column 7 lines 20-30, disclosing the patterned electrode 16

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having a transverse thickness of 8-12 microns. Burrows does not specifically disclose the electrode being deposited by the method of ink jet deposition, however, this method is very common in the art as evidenced by Sturm. It would have been obvious to one of ordinary skill in the art to have used ink jet deposition as the method of deposition of Burrows electrode considering its manufacturing feasibility since it is so widely used.

Regarding claim 17, Burrows and Sturm disclose the EL device of claim 2, but does not disclose the device being a passive matrix display. However, it is well known in the art to provide a passive matrix of EL elements comprising of row and column electrodes with sandwiched EL layers in order to provide a display device for a number of applications. Therefore, it would have been obvious to provide the EL element of Burrows and Sturm in a passive matrix display because such a configuration is so common when providing a display device.

Regarding claim 18, Burrows and Sturm disclose the EL device as described in claim 2, but does not disclose a battery operated or hand held electronic device provided with this EL device. However, it is old and well known in the art to use EL elements in electronic devices such as mobile phones. It would have been obvious to one of ordinary skill in the art to have used Sturm's invention in an electronic device because this is one of its most common applications.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows (US 5980976) in view of Sturm et al (US 6087196) further in view of Hung et al (US 5608287). Burrows and Sturm together disclose the EL device of claim 2, but do not disclose the work

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function of the electrode. However, it is very common to make electrodes of an EL device with work functions of 4.5 eV or less. For example, Hung et al discloses that the bottom electrode be made of alkaline or rare earth metals with work functions of less than 4.0 eV such as metal silicates or metal borides. Hung discloses that these metals provide protection from atmospheric corrosion. Therefore, it would have been obvious to one of ordinary skill to have used such a metal for the electrode of Sturm in order to protect the EL device from atmospheric corrosion.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burrows (US 5980976) in view of Sturm et al (US 6087196) further in view of Sreeram (US 6140759). Burrows and Sturm together disclose the EL device of claim 2, but do not disclose a relief pattern for patterning the electrode. Sreeram, however discloses a relief pattern 112 for patterning the electrode 114, and discloses that having such a relief pattern makes the deposition significantly less cumbersome. Therefore, it would have been obvious to one of ordinary skill in the art to have used a relief pattern such as Sreeram's in the invention of Burrows and Sturm in order to simplify the deposition process.

8) Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturm (US 6087196) in view of JP2003-205367A.

Regarding claim 10, Sturm discloses a method of manufacturing an EL device comprising a pattern-wise ink jet printed electrode for supplying charges to an EL layer of the device, the electrode comprising a metal or metal alloy that is ink-jet printed. See column 6 lines 1-10, for example. Sturm does not specifically recite the metal being in molten form while being printed. However, it is well known in the art to use a molten metal when ink-jet printing

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the electrodes of an EL device, as evidenced by JP2003-205367A. Sturm's ink-jet printing requires a wet deposition (thus the metal must be in liquid form). Using heat to liquefy a metal is a common, inexpensive and easy method of turning a solid metal into liquid form. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a molten metal in the ink jet printing of Sturm since it is well known and inexpensive.

Regarding claim 13, Sturm and JP2003-205367A disclose the method of claim 10, but do not specifically disclose the melting point. However, it is old and well known in the art to provide an electrode with a low melting point (less than 250 C) so that the temperature while manufacturing is low enough to save on cost as well as prevent unnecessary damage that comes about in high temperatures. Therefore, it would have been obvious to provide the electrode of Sturm with such a low melting point in order to protect the device against damage and save on cost.

9) Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sturm (US 6087196) in view of JP2003-205367A further in view of Sreeram (US 6140759).

Sturm and JP2003-205367A disclose the method of claim 10, but do not disclose a relief pattern. Sreeram discloses an EL device comprising a pattern wise ink jet printed electrode 114 for supplying charges to an EL layer, the electrode comprising a metal, further comprising a relief pattern 112 for patterning the pattern wise ink jet printed electrode. It would have been obvious to one of ordinary skill in the art to have included such a relief pattern in the invention of Sturm and JP2003-205367A since this method provides for a lesser margin of error during printing.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sturm (US 6087196) in view of JP2003-205367A further in view of Burrows (US 5980976).

Sturm and JP2003-205367A disclose the method of claim 10, but do not specifically disclose the thickness of the transverse profile of the non-molten metal. Burrows discloses an EL device comprising an electrode having a thickness of at least 5 microns. See column 7 lines 20-30, disclosing the patterned electrode 16 having a transverse thickness of 8-12 microns. It would have been obvious to one of ordinary skill in the art to have provided Sturms electrode with such a thickness because it is thick enough to provide for adequate charge supply, yet not too thick where it would end up interfering with other electrodes and cause problems such as crosstalk.

11. Claim 19 is rejected under 35 U.S.C.103(a) as being unpatentable over Sreeram (US 6140759) in view of Burrows (US 5980976).

Sreeram discloses the device of claim 6, but does not specifically disclose the thickness of the electrode. It is well known in the art to provide an electrode with a thickness of at least 5 microns, as evidenced by Burrows. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the electrode of Sreeram with the thickness of at least 5 microns because this thickness is commonly arrived at when ink jet printing an electrode.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sreeram (US 6140759). Sreeram disclose the EL device of claim 6, but does not specifically disclose the melting point of the electrode. However, it is old and well known in the art to provide an

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electrode with a low melting point (less than 250 C) so that the temperature while manufacturing is low enough to save on cost as well as prevent unnecessary damage that comes about in high temperatures. Therefore, it would have been obvious to provide the electrode of Sturm with such a low melting point in order to protect the device against damage and save on cost.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sumati Krishnan whose telephone number is 571-272-2372. The examiner can normally be reached on 9:00 am - 5:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SK


ASHOK PATEL
PRIMARY EXAMINER